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ADDENDUM TO REMEDIAL INVESTIGATION REPORT
MILLINGTON SITE
AIR SAMPLING RESULTS

Fred C. Hart Associates, Inc.



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ADDENDUM TO REMEDIAL INVESTIGATION REPORT
MILLINGTON SITE
AIR SAMPLING RESULTS

Prepared for:

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April 14, 1988

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TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	INTRODUCTION	1
2.0	AMBIENT AIR SAMPLING DURING FIELD ACTIVITIES . .	2
	2.1 Purpose	2
	2.2 Methodology	2
	2.3 Findings	3
3.0	AMBEINT AIR SAMPLING DURING NORMAL SITE CONDITIONS	9
	3.1 Purpose	9
	3.2 Methodology	9
	3.3 Findings	11
4.0	BASELINE RISK ASSESSMENT	15
	4.1 Purpose	15
	4.2 Findings	15
	4.3 Toxicological Evaluation	15
	4.4 Environmental Fate	17
	4.5 Receptors	18
	4.6 Present Risk	18
	4.7 Future Risk	19
References		
Appendix A Part 1: Asbestos in Air - During Field Activities		
	Part 2: Asbestos in Air - Ambient (No Field Activities) Events 1 and 2	

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
2-1	Pump Flow Rates & Volumes Pumped for Asbestos Air Samples - Millington Site-Field Activities	4
2-2	Asbestos Air Sampling Results and Weather Data - Millington Site-Field Activities	6
3-1	Pump Flow Rates & Volume Pumped for Asbestos Air Samples-Millington Site-No Field Activities	13
3-2	Asbestos Air Sampling Result and Weather Data- Millington Site - No Field Activities	14

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
2-1	Air Sampling-During Activities-Millington Site	5
3-1	Ambient Air-Event 1-Millington Site	10
3-2	Ambient Air-Event 2-Millington Site	12

1.0 INTRODUCTION

Pursuant to CERCLA Administrative Order-50103 between National Gypsum Company and the United States Environmental Protection Agency (USEPA), Fred C. Hart Associates, Inc. (HART), National Gypsum's consultants, conducted ambient air sampling at the Millington Site (the site) as part of the Remedial Investigation (RI) of the site in Morris County, N.J. During the initial phase of the RI, HART performed ambient air sampling during field disturbance activities to predict the amount of asbestos fibers which would be released during any excavation of the asbestos pile at the site. At EPA's request, HART conducted additional ambient air sampling under normal site conditions (i.e., no field activities) to obtain data for a baseline risk assessment.

On February 29, 1988, HART submitted to EPA a revised Remedial Investigation Report for the Millington Site. Due to wet weather conditions during January and February 1988, the additional ambient air sampling could not be conducted until March and therefore air sampling results were not included in the revised RI report. This Addendum to the Remedial Investigation Report for the Millington Site contains the purpose, methodology and findings of the ambient air sampling during field activities and normal site conditions, and a baseline risk assessment based on the air survey data.

2.0 AMBIENT AIR SAMPLING DURING FIELD ACTIVITIES

2.1 Purpose

During the subsurface investigations, ambient air samples were taken and analyzed for asbestos fiber concentrations. The subsurface investigations consisted of soil borings, well installations, and test pit operations, all of which had the potential to create airborne asbestos fibers by disturbing any asbestos-containing soils. The primary objective of these samples was to determine if significant amounts of asbestos fibers would be released during any excavation that might be undertaken as a remedial action and to predict the air quality impact at the site boundary.

A total of eight air samples were collected during drilling activities and another five air samples were taken during test pit excavation operations. The air samples included one sample for each test boring converted to a well, with the exception of the upgradient well at the Millington Site, and one duplicate and trip blank. In addition, one upwind and downwind sample were collected for each test pit along with a trip blank.

2.2 Methodology

Samples were taken by drawing ambient air through a triacetate filter using a Sensidyne BDX 44 sampling pump. Air was drawn through each pump at a rate of 1.4-2.3 liters/minute. The pump rates were tested before and after each use, with the use of a bubblemeter and the average of these readings was taken to be the flow rate during the sampling period. In addition, three to five runs were made on the bubblemeter during each test to obtain a more accurate flow rate for each sample. Each air sampling run was started when the drill rig or backhoe (for test pits) broke ground, and continued for as long as the subsurface disturbance activity lasted at each location. The total volume of air sampled in most cases was at least 200 liters. However, there were instances where the

subsurface investigation did not allow enough time for the pump to draw 200 liters of air. Table 2-1 provides pump flow rates and volumes pumped. Each sampler was set at 3 to 4 feet above ground and within 3 feet of each test hole. Whenever wind was detectable the sampler was placed immediately downwind of the drill rig. Air sampling locations are provided on Figure 2-1.

During excavation of test pits, two air sampling pumps were set up, started, and run simultaneously. One was set up 50 feet upwind and one 50 foot downwind of each excavation area. Since the wind on that particular day was almost still, both upwind and downwind locations were estimated. Air sampling locations were shown in Figure 2-1. A trip blank accompanied the air samples to the laboratory.

All air samples collected during the drilling activities were analyzed by Princeton Testing Laboratory using NIOSH Method 7400 phase contrast microscopy (PCM) for asbestos fiber concentrations. The test pit samples were analyzed by transmission electron microscopy (TEM), which can distinguish between types of asbestos and differentiate between asbestos and other fibers.

2.3 Findings

Results of the air sampling and the accompanying weather data are summarized in Table 2-2 and provided in Appendix A. The results of the laboratory analyses for the Millington Site showed that airborne asbestos fibers were not detected above the detection limit in any of the samples collected during test boring activities. It is important to note that before drilling commenced at the Millington Site, it rained for 2 to 3 days. This condition may have had an effect on the air samples, as most of the fibers augered up from the site appeared damp. Meteorological conditions of the sampling period can be found in Table 2-2.

The test pit samples from the Millington Site were analyzed by the TEM method to determine what types of asbestos fibers were present. Only one test pit sample, the upwind sample of test pit 2, contained any asbestos.

TABLE 2-1
PUMP FLOW RATES & VOLUMES PUMPED FOR ASBESTOS AIR SAMPLES
MILLINGTON SITE - FIELD ACTIVITIES

<u>Date Sampled</u>	<u>Location</u>	<u>Flow Rate (l/m)</u>	<u>Time Elapsed (minutes)</u>	<u>Volume (liters)</u>
8-12	902	2.20	180	396
8-12	908 (Dup 902)	2.10	180	378
8-6	903	2.10	180	378
8-11	904	2.15	180	387
8-15	905	2.10	120	252
8-13	906	2.10	180	378
8-14	907	2.10	150	315
8-15	Pit 1-Upwind	2.00	40	80.0
8-15	Pit 1-Downwind	1.80	40	72.0
8-15	Pit 2-Upwind	2.25	20	45.0
8-15	Pit 2-Downwind	1.73	20	34.6

l/m liters per minute

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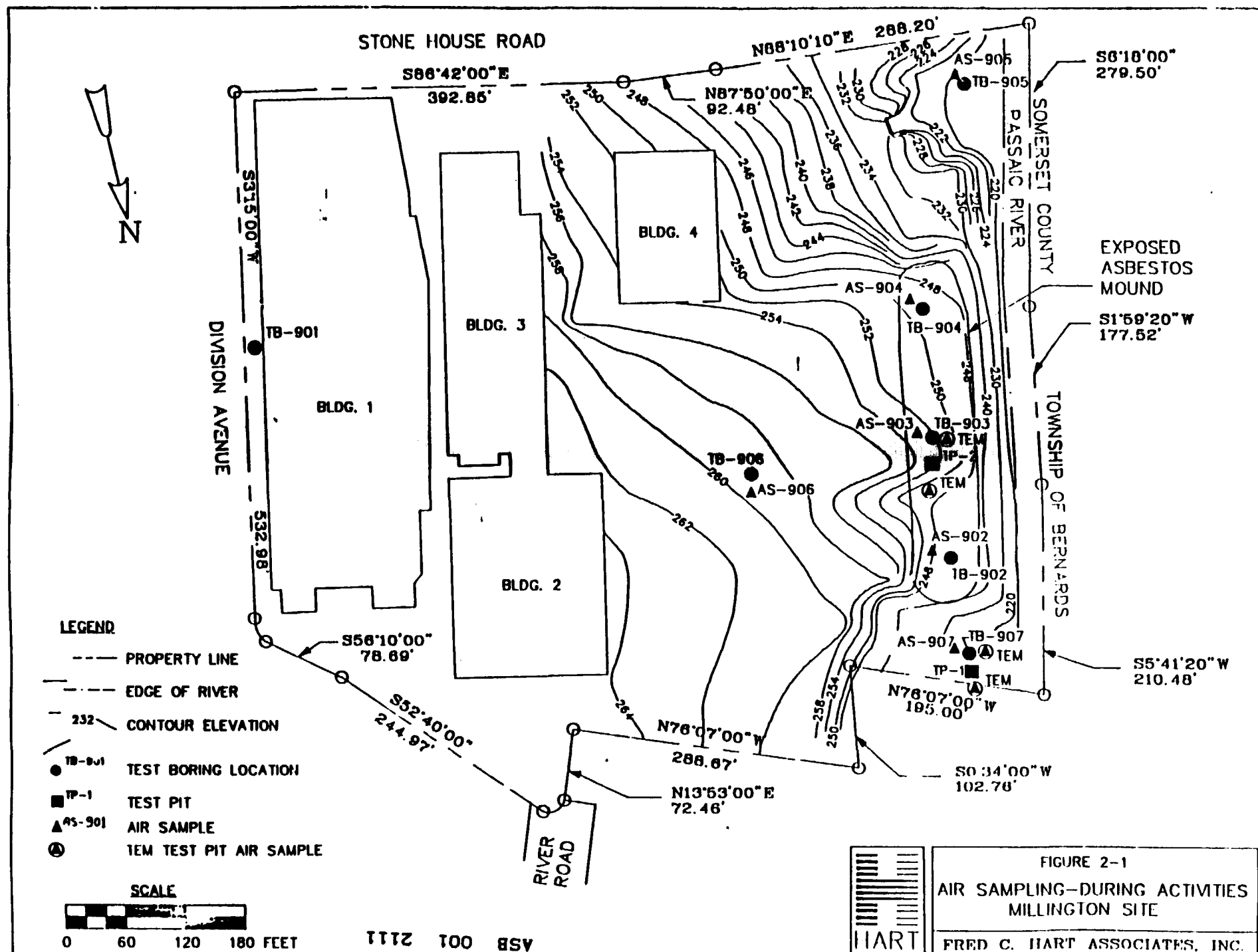


TABLE 2-2

ASBESTOS AIR SAMPLING RESULTS AND WEATHER DATAMILLINGTON SITE - FIELD ACTIVITIES

<u>Date</u>	<u>Location</u>	<u>Temp°F</u>	<u>Humidity rel %</u>	<u>Fibers/cc</u>	<u>Wind</u>
8-12-86	902	66°	60	<.01	<5 MPH
8-12-86	908 (dup. 902)	66°	60	<.01	<5 MPH
8-12-86	Trip Blank	-	-	<.01	-
8-6-86	903	76°	80	<.01	0
8-11-86	904	75°	90	<.01	<5 MPH
8-15-86	905	78-83°	58	<.01	0
8-13-86	906	67°	32	<.01	<5 MPH
8-14-86	907	75°	48	<.01	<5 MPH
8-15-86	Pit 1-Upwind*	78-83°	58	0.0000	0
	Pit 1-Downwind*	78-83°	58	0.0000	0
8-15-86	Pit 2-Upwind*	78-83°	58	0.2978**	0
	Pit 2-Downwind*	78-83°	58	0.0000	0
8-15-86	Trip Blank	78-83°	58	0.0000	0

* Samples analyzed by transmission electron microscopy (TEM). All other samples analyzed by phase contrast microscopy (PCM).

** The asbestos type identified was amosite amphibole.

The type of asbestos found was identified as amosite amphibole, at a concentration of 0.2978 fibers/cc which is below the current threshold limit value (TLV) of 0.5 fibers/cc for amosite.

The asbestos emission rate from excavation activities at the Millington Site was calculated with the use of a Gaussian dispersion equation and on-site air quality measurements. Two test pits, seven feet by ten feet by ten feet deep, were excavated by a backhoe while air sampling was being performed in the vicinity. It was intended to perform upwind and downwind air sampling; however, the calm conditions prevented choosing ideal upwind and downwind sampling sites. In fact, the low wind speed and high variability of wind direction resulted in the upwind site being impacted while the downwind site was not impacted. There was no other known sources of asbestos at the time of sampling.

The impacted site had an asbestos concentration of 0.3 fibers/cc (300,000 fibers/m³). The wind could have blown directly toward the samples or as much as 45 degrees to either side of the samples to result in an impact. Partial impact where the wind blew toward the samples for only part of the sampling period is a possibility, but choosing a continuous impact at 45 degrees significantly increases the conservative nature of the estimate and is used here to consider "worst case" impacts. The low wind speed of 0.5 m/sec (1 mph) was chosen to estimate the dispersion.

In order to utilize the Gaussian dispersion equation, procedures described in "Workbook of Atmospheric Dispersion Estimates", D. Bruce Turner, USEPA 1970, were utilized. Atmospheric stability was estimated using the flow chart in "Measurements of Fugitive Hydrocarbon Emissions from a Chemical Waste Disposal Site", James A. Peters, et al, APCA 81-41.1, 1981. The estimated stability class was B. Assuming the wind blew directly toward the samples the estimated emission rate was approximately 500,000 fibers/sec. Assuming the wind blew at a 45 degree angle from the samples, the samples would be on the edge of the plume. This would result in an emission rate of 150,000,000 fibers/sec. Since

the wind direction was highly variable, this latter estimate is probably closer to the actual emission rate than the former. This emission rate will be used in the analysis of the effects of site disturbance activities from various remedial alternatives to be addressed in the Feasibility Study.

3.0 AMBIENT AIR SAMPLING DURING NORMAL SITE CONDITIONS

3.1 Purpose

A series of ambient air samples were obtained at the Millington Site and analyzed for asbestos fiber counts. The primary objective of this sampling task was to determine whether asbestos fibers are being released under normal site conditions. No field activities were conducted during this sampling task. Air sampling data obtained from this task will be used in the baseline risk assessment for air (see Section 4.0).

3.2 Methodology

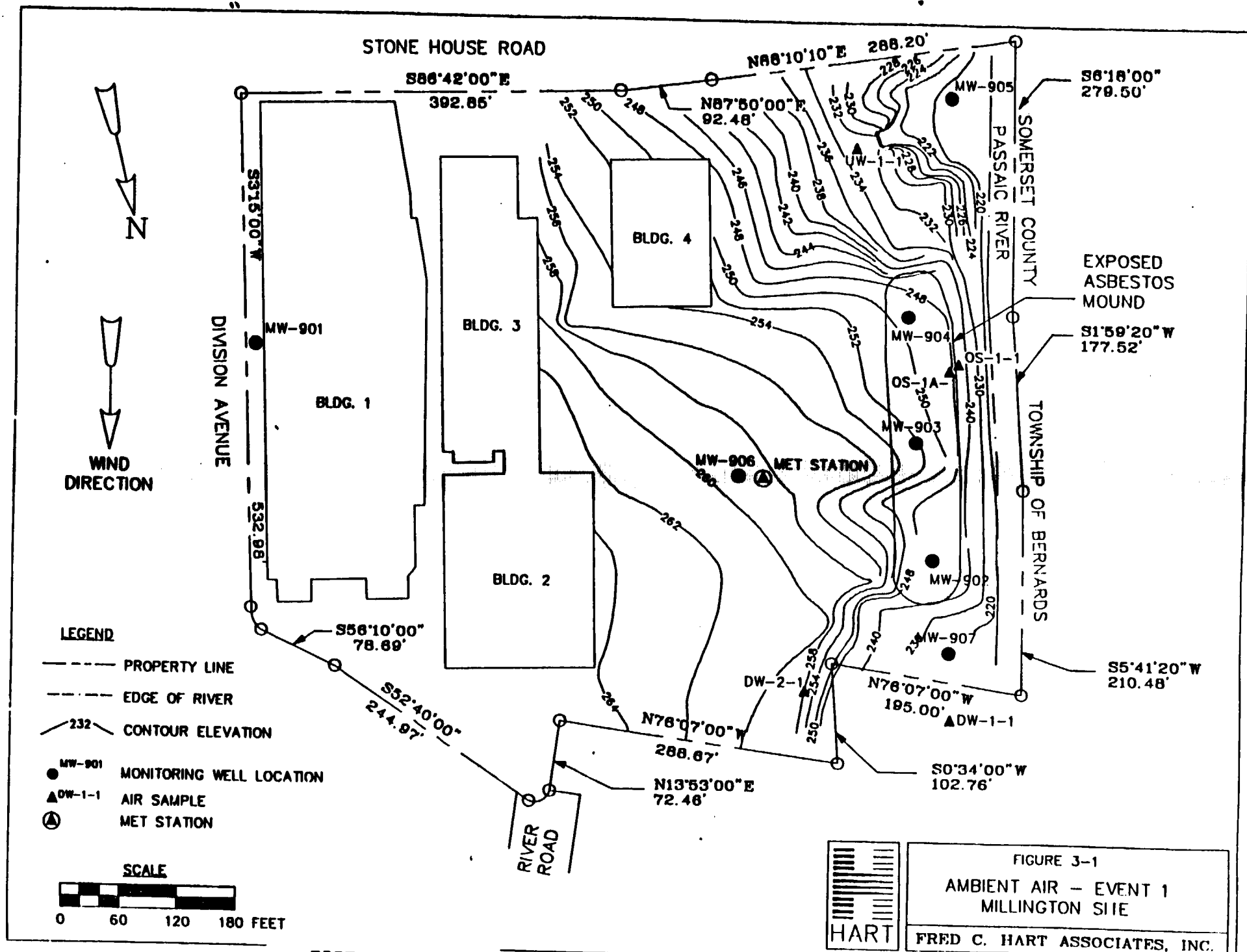
All air samples for asbestos were collected in accordance with NIOSH Method 7402. The samples were analyzed using the Yamati Method - Level 2 (TEM) by the R.J. Lee Group in Monroeville, PA.

Two sampling events were run, each following a period of five consecutive days without rain. The sampling events occurred on March 25 and 31, 1988. Gillian HFS 513 air sampling pumps were used with 0.8 um cellulose ester membrane filters in 25 mm cassettes. Each sampling pump was calibrated to 3 liters/minute prior to and immediately after each sampling event with a Gillian precision rotometer and a filter cassette attached in line with the pump and rotometer. A total of five pumps were used in the sampling events: one on the asbestos mound; two at a downwind location; and one at an upwind location of the asbestos mound. The fifth was used as a duplicate at various locations: the first day on site; the second day at a downwind location; and the third day at a second downwind location.

To determine wind direction, a meteorological station was set up one hour prior to the start of sampling. Locations for upwind and downwind samples along the site boundaries were then determined from the meteorological station readings. Sampling locations for the first event are shown in Figure 3-1 and sampling locations for the second event are

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shown in Figure 3-2. Each pump ran for an eight hour period allowing the pump to draw 1440 liters of air through the filters. Pump and flow rates are provided in Table 3-1. With each set of samples, a field blank was collected by opening a cassette, exposing the filter to air for 30 to 40 seconds and then closing the cassette. A trip blank was also collected by sending a closed cassette from the batch used for sampling to the laboratory for analysis. All samples were sent to the laboratory under full chain-of-custody procedures via Federal Express.

The meteorological station ran for about 9 to 9.5 hours on each day of sampling.

3.3 Findings

Results of the laboratory analysis of the ambient air samples obtained at the Millington Site are summarized in Table 3-2 and provided in Appendix A. The results showed no airborne asbestos fibers in all but one on-site sample. This sample, OS-1A-1, had .004 fibers/cc which is also the detection limit for the method. This value was not confirmed in the duplicate sample.

The detected fiber was identified as chrysotile which has a threshold limit value (TLV) of 2 fibers/cc. Other available standards or criteria for asbestos include the OSHA Action Level of 0.1 fiber/cc, OSHA Permissible Exposure Limit of 0.2 fibers/cc and EPA Clearance Criteria of 0.01 fiber/cc. The detected value of .004 fibers/cc is below all of these standards/criteria.

The weather was dry for five days prior to each sampling event. On each sampling date, the weather conditions were clear and sunny with temperatures in the 60's and 70's. In addition, the ground appeared dry during both sampling days. Meteorological conditions are listed in Table 3-2 and shown on strip charts in Appendix A.

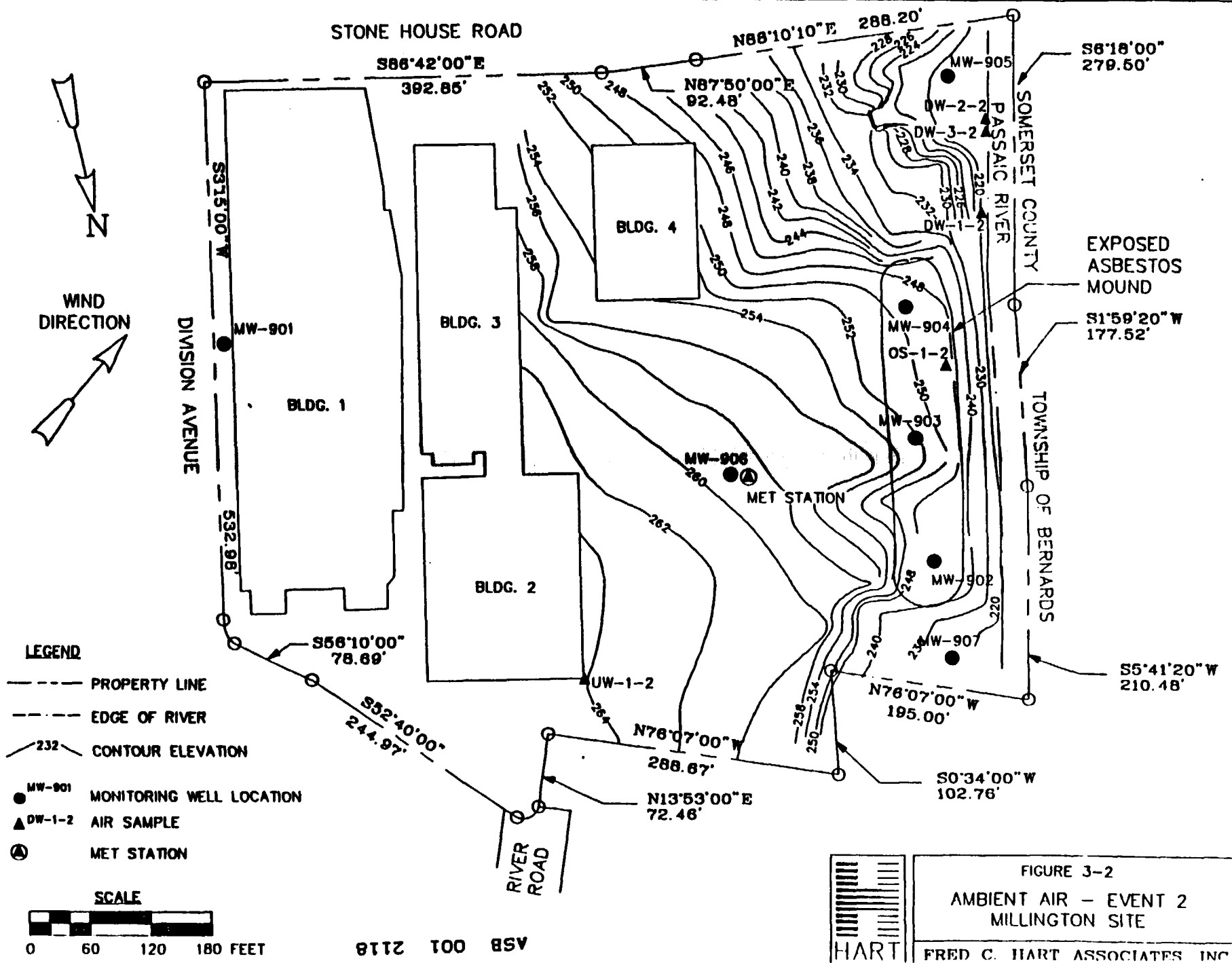


TABLE 3-1

PUMP FLOW RATES & VOLUMES PUMPED FOR ASBESTOS AIR SAMPLES
MILLINGTON SITE - NO FIELD ACTIVITIES

<u>Date Sampled</u>	<u>Location</u>	<u>Flow Rate (l/m)</u>	<u>Time Elapsed (minutes)</u>	<u>Volume (liters)</u>
<u>Event 1</u>				
3-25	DW-1-1	3.0	480	1440
3-25	DW-2-1	3.0	480	1440
3-25	OS-1-1	3.0	480	1440
3-25	UW-1-1	3.0	480	1440
3-25	OS-1A-1(Dup OS-1-1)	3.0	480	1440
<u>Event 2</u>				
3-31	DW-1-2	3.0	480	1440
3-31	DW-2-2	3.0	480	1440
3-31	DW-3-2(Dup DW-2-2)	3.0	480	1440
3-31	OS-1-2	3.0	480	1440
3-31	UW-1-2	3.0	480	1440

l/m liters per minute

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TABLE 3-2

ASBESTOS AIR SAMPLING RESULTS AND WEATHER DATA*MILLINGTON SITE - NO FIELD ACTIVITY

<u>Date</u>	<u>Location</u>	<u>Temp°F</u>	<u>Fibers/cc</u>	<u>Wind Speed</u>	<u>Wind Direction</u>
<u>Event 1</u>					
3-25	DW-1-1	60°	<.004	8-10 mph	Southwest
3-25	DW-2-1	60°	<.004	8-10 mph	Southwest
3-25	OS-1-1	60°	<.004	8-10 mph	Southwest
3-25	US-1-1	60°	<.004	8-10 mph	Southwest
3-25	OS-1A-1 (Dup OS-1-1)	60°	.004**	8-10 mph	Southwest
<u>Event 2</u>					
3-31	DW-1-2	58-75°	<.004	3-5 mph	Variable***
3-31	DW-2-2	58-75°	<.004	3-5 mph	Variable
3-31	DW-3-2 (Dup DW-2-2)	58-75°	<.004	3-5 mph	Variable
3-31	OS-1-2	58-75°	<.004	3-5 mph	Variable
3-31	UW-1-2	58-75°	<.004	3-5 mph	Variable

* Samples analyzed by Yamati Method Level 2 (TEM).

** The asbestos type identified was Chrysotile amphibole.

*** AM wind direction from Northeast.

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4.0 BASELINE RISK ASSESSMENT

4.1 Purpose

This report contains a baseline risk assessment and toxicological assessment for air survey data from the former National Gypsum plant in Millington, New Jersey. The objective of this assessment is to qualitatively define the health risks associated with ambient air levels of asbestos at the site under normal site conditions.

4.2 Findings

Ambient air data was obtained from two sampling events. One event was conducted on March 25, 1987 and another on March 31, 1987. Each event consisted of four samples and one duplicate collected over an eight hour period. More detailed explanations of the methodology used for ambient air monitoring is found in Section 3.2.

Of the ten samples taken (total), only one positive hit was detected. This value was .004 fibers/cc for the sampling point on the asbestos pile in the first sampling event. The value was not confirmed in the duplicate sample nor repeated in the second sampling event. Chrysotile was the indicated type of asbestos fiber.

4.3 Toxicological Evaluation

Asbestos. Asbestos is a generic term applied to a large group of hydrate silicates containing metal cations such as sodium, magnesium, calcium and iron. Asbestos can be separated into two mineral groups, serpentine and amphibole. Chrysotile, the most important commercial asbestos, is a serpentine mineral. The amphiboles include actinolite, amosite, anthophyllite, crocidolite and tremolite.

Available information indicates that the toxicity and carcinogenicity of asbestos is associated with the nature, size and sometimes geographic origination of the fibers. The toxic action of asbestos occurs as a result of the mechanical penetration of tissue barriers by the fibers. Distribution of fibers from entry points to other tissues is aided by phagocytic uptake by macrophages and monocytes and movement through the lymphatic system or bloodstream.

Asbestosis in humans is characterized by diffuse interstitial fibrosis, calcification and fibrosis of the pleura, bronchiogenic carcinoma and mesothelial tumors. The exact mechanism of system initiation by asbestos fibers is unknown.

There is little data available on the subchronic effects of oral exposure to asbestos by humans. Humans exhibited airflow abnormalities inhalation following five months of exposures via inhalation. Inhalation exposures to rats resulted in considerable changes in alveolar epithelial and interstitial cells. Guinea pigs developed pulmonary fibrosis, interstitial pneumonitis, cuboidal metaplasia of the epithelium of the alveolar ducts and cor pulmonale following inhalation (USEPA, 1984).

The most toxic effects associated with asbestos are chronic in nature, requiring long periods of time for expression. Although most chronic effects are carcinogenic, there are a number of non-carcinogenic effects such as pneumoconiosis, pulmonary dysfunction, diffusional defects and airway obstruction.

Exposure to asbestos has been associated with bronchiogenic carcinoma, mesothelioma, and gastrointestinal cancer in humans. Based on observed carcinogenesis in humans, supported by animal bioassay data, asbestos is classified as a Group A substance (Human Carcinogen) (USEPA, 1984). Data was not located concerning teratogenicity of asbestos.

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4.4 Environmental Fate

Asbestos is a stable, naturally occurring mineral known for its ability to form relatively soft, silky fibers. While there are several definitions for the term asbestos, the definition currently used by EPA is from the notice of proposed rule-making for "Occupational Exposure to Asbestos" published in the Federal Register (October 9, 1975; pp. 47652, 47660) by the U.S. Occupational Safety and Health Administration (OSHA). Asbestos form minerals are divided into two main classes: serpentine and amphibole. Chrysotile asbestos is the only member of the serpentine class and comprises more than 95 percent of the asbestos fibers produced today. There are presently five known types of amphibole: crocidolite, amosite, anthophyllite, tremolite and actinolite. The minerals chrysotile, amosite, crocidolite, tremolite, anthophyllite and actinolite are classified as "asbestos" if the individual crystal fragments are greater than 5 micrometers in length, less than 5 micrometers in diameter, and have a length to diameter ratio of three or greater.

Air acts as a medium for the transport of fibers. The rate of any dispersion would be dependent on a variety of factors, including wind speed and humidity. After becoming airborne, fibers will either settle through dry fallout or be washed out through precipitation. Through deposition, fibers will fall out on either soil or water.

In the aquatic environment, asbestos is not prone to significant chemical or biological degradation. Photolysis does not occur and volatilization occurs at insignificant levels. Bioaccumulation has not been observed in aquatic organisms and biotransformation does not occur. Chemical speciation is a possible fate process; dissolution of chrysotile materials has been observed. Asbestos does not have an adsorptive affinity for chemicals normally found in natural water (aquatic) systems. However, some primarily organic compounds and trace metals, have an affinity for adsorbing asbestos materials. Once introduced into a surface water system, asbestos will tend to remain in suspension until physical and chemical degradation or physical agitation allows it to settle into bottom sediments.

4.5 Receptors

The Millington Site is located in a suburban position of Morris County in north-central New Jersey. Millington has a population of approximately 7800. The site is located adjacent to a leased office storage space complex containing twenty-one firms. These firms collectively employ 150-200 personnel.

In addition, within a one mile radius of the site, there are approximately 200 residences containing up to 640 residents. Other exposed human areas include the Millington train station and a local school. The Millington train station is located adjacent to the site, which an approximately 252 people frequent daily during peak rush hours. Further, there is an eatery located at the train station which serves approximately 300 people per day. The local school is approximately one mile from the site and contains 243 students.

The primary receptors associated with ambient air levels of asbestos would be site employees. The point where the asbestos mound is located, however, is well removed from any routine activity and not frequented by individuals.

4.6 Present Risk

From a qualitative standpoint, there is no present risk at the site or surrounding area as a result of airborne asbestos fibers. Fibers were only detected at one point in eight samples, indicating that the cap of soil and vegetation over the asbestos mound is curtailing their becoming airborne.

The value of .004 fibers/cc at the point on the asbestos mound does not represent a risk, because the value does not exceed any established criteria and receptors are limited due to the location of the asbestos pile. Applicable standards and criteria used for comparison are OSHA Action Levels (0.1 fiber/cc) and OSHA Permissible Exposure Limits

(0.2 fiber/cc) as well as EPA Clearance Criteria (0.01 fiber/cc). Although these standards/criteria are for indoor settings, they are the only standards/criteria available.

4.7 Future Risk

In the absence of any changes to the site, future risks are the same as present risks. Any remediation efforts that would remove the cover soil and vegetation would substantially increase the risk of airborne fibers; not only to the workers effecting remediation, but also to the surrounding population. Exposure of asbestos and a resulting increase in risk levels from airborne fibers could also occur if soil erosion on the side of the mound closest to the river is allowed to continue unchecked.

REFERENCES

Peters, Jane A., 1981, Measurements of Fugitive Hydrocarbon Emissions from a Chemical Waste Disposal Site, APCA 81-41.1.

Turner, Bruce D., 1970, Workbook of Atmospheric Dispersion Estimates, USEPA.

USEPA, 1984, Health Effects Assessment for Asbestos, EPA/540/1-86/049.

APPENDIX A

**PART 1: ASBESTOS IN AIR
DURING FIELD ACTIVITIES**

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Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492

princeton testing laboratory



August 26, 1986

TO: Fred C. Hart Associates, Inc.
530 Fifth Ave
New York, NY 10036-5166

JOB #: 86H1366

ANALYSIS: Asbestos in air

METHOD: NIOSH 7400, Phase contrast microscopy

DATE OF TEST: ---

LOCATION: Millington - Project #01005-00-85001-00

RESULTS: Sample	Time	Volume (l)	Fibers/cc
8- 6 well 903	0918-1218	378	< 0.01
8-11 well 904	1000-1300	387	< 0.01
8-12 well 902	1010-1310	396	< 0.01
8-12 well 908	1010-1310	378	< 0.01
8-12 blank	0910-1210	--	< 0.01
8-13 well 906	1000-1300	378	< 0.01

David Kichula
David Kichula, Manager
Industrial Hygiene

ASB 001 2128

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492



princeton
testing
laboratory

P.O. Box 2108 Princeton, N.J. 08540



September 25, 1986

TO: Fred C. Hart Associates
530 5th Avenue
New York, NY 10036

JOB #: 86H1420

ANALYSIS: Asbestos in air

METHOD: NIOSH 7400, Phase contrast microscopy

DATE OF TEST: 8-15-86

LOCATION: Well 905, Well 907

RESULTS:

Sample	Time	Volume (l)	Fibers/cc
Well 905	1227-1427	252	< 0.01
Well 907	1310-1540	315	< 0.01
Blank	---	---	< 0.01

David Kichula
David Kichula, Manager
Industrial Hygiene



ASB 001 2129

Princeton Service Center
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TLX 84-3492



Princeton, N.J. 08540

ASBESTOS FIBER ANALYSIS by TRANSMISSION ELECTRON MICROSCOPY (TEM),
SELECTED AREA ELECTRON DIFFRACTION (SAED), and ENERGY
DISPERSIVE X-RAY MICROANALYSIS (EDX) --- EPA LEVEL II

Air Sample # Blank

Project: Fred C. Hart Assoc. Job # 86H 1420 PO # 7566

CONDENSED DATA

1. Number of Asbestos Fibers analyzed	0
2. Number of Nonasbestos Fibers analyzed	1
3. Number of Ambiguous Fibers analyzed	0
4. Asbestos type:	none detected
5. Number of Asbestos fibers in whole filter (in millions)	0.0000
6. Detection Limit	0.0067
7. Percentage of concentration due to Asbestos Fibers $\geq 5 \mu\text{m}$ (microns) in length	0.000 %
8. Mass of Asbestos Fibers (nanograms/filter)	0.0000
9. Percentage of mass due to Asbestos fibers equal to or greater than $5 \mu\text{m}$ in length	0.0000 %

Comments: Grid openings analyzed: 20.000 Filter: NCE 37mm
PCM equivalent fibers/filter (million) 0.0067



Air Sample # Blank

FIBER TYPE and FIBER SIZE DISTRIBUTION

	CHRYSTILE	AMPHIBOLE	AMBIGUOUS	NON-ASBESTOS	TOTAL ASBESTOS	TOTAL FIBERS
COUNT						
Fibers Analyzed	0	0	0	1	0	1
# of Fibers in Whole Filter in millions of fibers	0.000	0.000	0.000	0.0067	0.000	0.007
MASS						
Concentration in ng/filter	0.000	0.000	-----	-----	0.000	-----
% of Mass due to Fibers $\geq 5 \mu m$ in length	0.000%	0.000%	-----	-----	0.000%	-----

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492



Princeton No. 10547

ASBESTOS FIBER ANALYSIS by TRANSMISSION ELECTRON MICROSCOPY (TEM),
SELECTED AREA ELECTRON DIFFRACTION (SAED), and ENERGY
DISPERSIVE X-RAY MICROANALYSIS (EDX) --- EPA LEVEL II

Air Sample # Test Pit 2 Downwind

Project: Fred C. Hart Assoc. Job # 60H 1420 PO # 7566

Volume= 35.4000 Liters

CONDENSED DATA

1. Number of Asbestos Fibers analyzed	0
2. Number of Nonasbestos Fibers analyzed	8
3. Number of Ambiguous Fibers analyzed	0
4. Asbestos type:	none detected
5. Concentration (in fibers/cc or million/m ³) of Asbestos Fibers	0.0000
6. Detection Limit	0.1893
7. Percentage of concentration due to Asbestos Fibers $\geq 5 \mu\text{m}$ (microns) in length	0.000 %
8. Mass of Asbestos Fibers (nanograms/m ³)	0.0000
9. Percentage of mass due to Asbestos fibers equal to or greater than $5 \mu\text{m}$ in length	0.0000 %

Comments: Grid openings analyzed: 20.0 Filter Type: MCE 37 mm
PCM equivalent (fibers/cc) 2.2712
Nonasbestos fibers present were glass, cellulose, other organic
fibers and fibers containing the element Si.



ASB 001 2132

FIBER TYPE and FIBER SIZE DISTRIBUTION

	CHRYSTILE	AMPHIBOLE	AMBIGUOUS	NONASBESTOS	TOTAL ASBESTOS	TOTAL FIBERS
COUNT						
Fibers Analyzed	0	0	0	9	0	9
# of Fibers in Whole Filter in millions of fibers	0.000	0.000	0.000	0.0536	0.000	0.054
Concentration in million fibers/m ³	0.000	0.000	0.000	1.5141	0.000	1.514
% of Count due to Fibers $\geq 5 \mu m$ in length	0.000%	0.000%	0.000%	---	0.000%	---
MASS						
Concentration in ng/m ³	0.000	0.000	-----	-----	0.000	-----
% of Mass due to Fibers $\geq 5 \mu m$ in length	0.000%	0.000%	-----	-----	0.000%	-----

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 94-3492



609-215-3100 Princeton, NJ 08542

ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM),
SELECTED AREA ELECTRON DIFFRACTION (SAED), and ENERGY
DISPERSIVE X-RAY MICROANALYSIS (EDX) --- EPA LEVEL II

Air Sample # Test Pit 2 Upwind
Project: Fred C. Hart Assoc. Job # 86H 1420 PO # 7586
Volume= 45.0000 Liters

CONDENSED DATA

1. Number of Asbestos Fibers analyzed	1
2. Number of Nonasbestos Fibers analyzed	5
3. Number of Ambiguous Fibers analyzed	0
4. Asbestos type:	amosite amphibole
5. Concentration (in fibers/cc or million/m ³ , of Asbestos Fibers	0.2978
6. Detection Limit	0.2978
7. Percentage of concentration due to Asbestos Fibers ≥ 5 μ m (microns) in length	0.000 %
8. Mass of Asbestos Fibers (nanograms/m ³)	426.667
9. Percentage of mass due to Asbestos fibers equal to or greater than 5 μ m in length	0.0000 %

Comments: Grid openings analyzed: 10.0 Filter Type: MCE 37 mm
PCM equivalent (fibers/cc) 4.4667
Nonasbestos fibers present were cellulose and other organic fibers.



ASB 001 2134

FIBER TYPE and FIBER SIZE DISTRIBUTION

	CHRYSTILE	AMPHIBOLE	AMBIGUOUS	NONASBESTOS	TOTAL ASBESTOS	TOTAL FIBERS
COUNT						
Fibers Analyzed	0	1	0	5	1	6
# of Fibers in Whole Filter in millions of fibers	0.000	0.013	0.000	0.0670	0.013	0.080
Concentration in million fibers/m ³	0.000	0.298	0.000	1.4889	0.299	1.787
% of Count due to Fibers $\geq 5 \mu m$ in length	0.000%	0.000%	0.000%	-----	0.000%	-----
MASS						
Concentration in ng/m ³	0.000	426.667	-----	-----	426.667	-----
% of Mass due to Fibers $\geq 5 \mu m$ in length	0.000%	0.000%	-----	-----	0.000%	-----

Princeton Service Center
U.S. Route 1
609-452-9050
TLX 84-3492



ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM),
SELECTED AREA ELECTRON DIFFRACTION (SAED), and ENERGY
DISPERSIVE X-RAY MICROANALYSIS (ED) - ALL LEVEL 1:

Air Sample # Test Pit 1 Downwind
Project: Fred C. Hart Assoc. Job # 86H 1420 PO # 7566
Volume= 72,0000 Liters

CONDENSED DATA

1. Number of Asbestos Fibers analyzed	0
2. Number of Nonasbestos Fibers analyzed	1
3. Number of Ambiguous Fibers analyzed	0
4. Asbestos type:	none detected
5. Concentration (in fibers/cc or million/m ³ , of Asbestos Fibers	0.0000
6. Detection Limit	0.1861
7. Percentage of concentration due to Asbestos Fibers $\geq 5 \mu\text{m}$ (microns) in length	0.0000 %
8. Mass of Asbestos Fibers (nanograms/m ³)	0.0000
9. Percentage of mass due to Asbestos fibers equal to or greater than $5 \mu\text{m}$ in length	0.0000 %

Comments: Grid openings analyzed: 10.0 Filter Type: MCE 37 mm
PCM equivalent (fibers/cc) 0.7404



ASB 001 2136

FIBER TYPE and FIBER SIZE DISTRIBUTION

	CHRYSTILE	AMPHIBOLE	AMBIODUCUS	NONASBESTOS	TOTAL ASBESTOS	TOTAL FIBERS
COUNT						
Fibers Analyzed	0	0	0	1	0	1
# of Fibers in Whole Filter in millions of fibers	0.000	0.000	0.000	0.0134	0.000	0.013
Concentration in million fibers/m ³	0.000	0.000	0.000	0.1861	0.000	0.186
% of Count due to Fibers $\geq 5 \mu\text{m}$ in length	0.000%	0.000%	0.000%	-----	0.000%	-----
MASS						
Concentration in ng/m ³	0.000	0.000	-----	-----	0.000	-----
% of Mass due to Fibers $\geq 5 \mu\text{m}$ in length	0.000%	0.000%	-----	-----	0.000%	-----



**princeton
testing
laboratory**



ASBESTOS FIBER ANALYSIS BY TRANSMISSION ELECTRON MICROSCOPY (TEM),
SELECTED AREA ELECTRON DIFFRACTION (SAED), AND ENERGY
DISPERSIVE X-RAY MICROANALYSIS (EDS) --- SEE PAGE 11

CONDENSED DATA

1. Number of Asbestos Fibers analyzed	0
2. Number of Nonasbestos Fibers analyzed	3
3. Number of Ambiguous Fibers analyzed	0
4. Asbestos type:	none detected
5. Concentration (in fibers/cc or million/m ³) of Asbestos Fibers	0.0000
6. Detection Limit	0.0333
7. Percentage of concentration due to Asbestos Fibers ≥ 5 μ m (microns) in length	0.000 %
8. Mass of Asbestos Fibers (nanograms/m ³)	0.0000
9. Percentage of mass due to Asbestos fibers equal to or greater than 5 μ m in length	0.0000 %

Comments: Grid openings analyzed: 20.0 Filter Type: MCE 37 mm
PCM equivalent (fibers/cc) 0.4133



ASB 001

2138

FIBER TYPE and FIBER SIZE DISTRIBUTION

	CHRYSTILE	AMPHIBOLE	AMBIGUOUS	NONASBESTOS	TOTAL ASBESTOS	TOTAL FIBERS
COUNT						
Fibers Analyzed	0	0	0	3	0	3
# of Fibers in Whole Filter in millions of fibers	0.000	0.000	0.000	0.0201	0.000	0.020
Concentration in million fibers/m ³	0.000	0.000	0.000	0.2513	0.000	0.251
% of Count due to Fibers ≥ 5 μ m in length	0.000%	0.000%	0.000%	-----	0.000%	-----
MASS						
Concentration in μ g/m ³	0.000	0.000	-----	-----	0.000	-----
% of Mass due to Fibers ≥ 5 μ m in length	0.000%	0.000%	-----	-----	0.000%	-----

MONITORING DATA SHEET

CLIENT: Food C. Hunt Assoc DATE 8/15/86
 ADDRESS: 730 5th Ave JOB #: 01007-00-85001-00
100 York N.Y. 10026

SAMPLE NO. SAMPLE NO.

FILTERS: TENAX:

DESCRIPTION OF TEST: Air to air IMPINGERS: CHARCOAL:

Sampler done by *TEM* BULK/WIPE: CHROM. 102:

OTHER: SILICA GEL:

LOCATION: Test P.L. 142 BAROMETRIC PRESSURE 51.42 in Hg

TRIP Plant Gr. Test P.L. TEMPERATURE 78-83 °F

PAYMENT: RELATIVE HUMIDITY 58 %

CALIBRATED BY/DATE Alcon 8/15/86 CORRECTION FACTOR _____ (STP)

Analyze by TEM

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
<u>Test P.L. 1</u>					
#1 <u>Upwind</u>	<u>2.0</u>	<u>3:20</u>	<u>4:00</u>	<u>40 min</u>	<u>80 liters</u>
#2 <u>Downwind</u>	<u>1.8</u>	<u>3:20</u>	<u>4:00</u>	<u>40 min</u>	<u>72 liters</u>
#3					
#4 <u>Test P.L. 2 Upwind</u>	<u>2.25</u>	<u>4:25</u>	<u>4:45</u>	<u>20 min</u>	<u>45 liters</u>
#5 <u>Downwind</u>	<u>1.725</u>	<u>4:45</u>	<u>4:45</u>	<u>20 min</u>	<u>345 liters</u>
#6					
<u>4 Trip Blanks For</u>					
<u>Test P.L. Sampler</u>					

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>F. Lee</u>	<u>8/19/86</u>	<u>Alcon</u>				

PRINCETON TESTING LABORATORY

MONITORING DATA SHEET

CLIENT: Fred C. Hart Assoc DATE 8/13/86
 ADDRESS: 530 5th Ave. JOB #: 01005-0045001-00
New York, N.Y. 10036 SAMPLE NO. SAMPLE NO.
Attn: Francine Barker FILTERS: TENAX:
 DESCRIPTION OF TEST: Air Sampling IMPINGERS: CHARCOAL:
for Asbestos BULK/WIPE: CHROM. 102:
 LOCATION: Well 902, Well 908 OTHER: SILICA GEL: Slight Wind < 5 mph
Field Blank BAROMETRIC PRESSURE mm Hg
 PAYMENT: RELATIVE HUMIDITY 66% °F
 CALIBRATED BY/DATE A. Long 8/12/86 CORRECTION FACTOR 1 (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
Well 902 Start calibr.	2.2	10:10	11:10	1 hr.	
Stop calibr.	2.2				
on sig. Average	2.2	X 180 =			396 liters
Well 908 Start Calibr.	2.2	10:10	11:10	1 hr.	
on tree cft. Stop Calibr.	2.0				
from sig. Average	2.1	X 180 =			378 liters
Field Blank		9:10	12:10	3 hrs.	
Site - Near U-Haul					

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>Hanna Long</u>	<u>8/13/86</u>	<u>K. Alphin</u>	<u>8/14/86</u>	<u>10:35</u>		

PRINCETON TESTING LABORATORY

MONITORING DATA SHEET

CLIENT: Ford C Hart Assoc DATE 8/11/86
 ADDRESS: 770 5th Ave JOB #: 0005-00-45001-00
New York N.Y. 10076
 SAMPLE NO. SAMPLE NO.
 FILTERS: TENAX:
 DESCRIPTION OF TEST: As Sampling IMPINGERS: CHARCOAL:
for asbestos BULK/WIPE: CHROM. 102:
 OTHER: SILICA GEL:
 LOCATION: Well 904 BAROMETRIC PRESSURE Slight wind mm Hg
 TEMPERATURE 75 °F
 PAYMENT: RELATIVE HUMIDITY 90 %
 CALIBRATED BY/DATE AL 8/11/86 CORRECTION FACTOR _____ (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
3 Well 904 Calibration before	2.2	10:00 AM	1:00 PM	3 hrs.	(387 l. hrs.)
After Calibration	2.1				
on Rig average	2.15				(582 l. hrs.)

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY: ..	TIME/DATE	RECEIVED BY:
Narcis Leary	8/12/86	<i>[Signature]</i>	8/14/86	10:35		

MONITORING DATA SHEET

CLIENT: Food Mart Assoc. DATE 8/6/86
 ADDRESS: 530 5th Ave JOB #: 01005-00-85001-00
New York, N.Y. 10036 SAMPLE NO. SAMPLE NO.
 FILTERS: TENAX:
 DESCRIPTION OF TEST: Air Sampling IMPINGERS: CHARCOAL:
for Asbestos BULK/WIPE: CHROM. 102:
 OTHER: SILICA GEL:
 LOCATION: Well 903 BAROMETRIC PRESSURE No Wind - Circumvent
(no wind) - Circumvent TEMPERATURE 76 °F
 PAYMENT: RELATIVE HUMIDITY 80 %
 CALIBRATED BY/DATE ALey 8/6/86 CORRECTION FACTOR _____ (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
<u>Well 903</u> ^{After calibration}	<u>2.3</u>	<u>9:18</u>	<u>12:18</u>	<u>3 hrs.</u>	
<u>After calibration</u>	<u>1.9</u>				
<u>2</u> <u>Average</u>	<u>2.1</u>			<u>3 hrs.</u>	<u>(378 l.)</u>

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>Haron Levy</u>	<u>8/12/86</u> <u>8/13/86</u>	<u>ALey</u>	<u>8/14/86 10:35</u>			

PRINCETON TESTING LABORATORY

MONITORING DATA SHEET

CLIENT: Fred C Hart DATE 8/13/86
 ADDRESS: 530 5th Ave. JOB #: 01005-00-85001-00
New York, N.Y. 10036
 SAMPLE NO. SAMPLE NO.
 FILTERS: TENAX:
 DESCRIPTION OF TEST: Air Sampling IMPINGERS: CHARCOAL:
for asbestos BULK/WIPE: CHROM. 102:
 OTHER: SILICA GEL:
 LOCATION: Well 906 BAROMETRIC PRESSURE 5 MPH-wind Hg
4.5' High - on Rig TEMPERATURE 67-75°F
 PAYMENT: RELATIVE HUMIDITY 32%
 CALIBRATED BY/DATE A. Levy 8/13/86 CORRECTION FACTOR _____ (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
<u>Well 906 Before Calibration</u>	<u>2.1</u>	<u>10:00</u>	<u>1:00</u>	<u>1:50 min</u>	
<u>After Calibration</u>	<u>2.1</u>				
<u>Ave.</u>	<u>2.1</u>				<u>378 liters</u>

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>Boris Levy</u>	<u>8/13/86</u>	<u>8/14/86 10:35</u>	<u>Kalifore</u>			

ASB 100 001 4417

MONITORING DATA SHEET

CLIENT: Food (L) + Assoc DATE 8/1-12

ADDRESS: 730 5th Ave. JOB #: 61007-10-25001-00
New York NY 10022

DESCRIPTION OF TEST: Libertor SAMPLE NO. _____ SAMPLE NO. _____
air samples done by FILTERS: _____ TENAX: _____
* PCM Method IMPINGERS: _____ CHARCOAL: _____
 LOCATION: 11211 905 BULK/WIPE: _____ CHROM. 102: _____
 OTHER: _____ SILICA GEL: no silica
 BAROMETRIC PRESSURE _____ mm Hg
 TEMPERATURE 78-83 °F
 PAYMENT: _____ RELATIVE HUMIDITY 58 %
 CALIBRATED BY/DATE PLew 8/15/86 CORRECTION FACTOR _____ (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
<u>11211 905</u>					
<u>Calibration Before</u>	<u>2.1</u>	<u>12:27</u>	<u>2:27</u>	<u>2 hrs.</u>	
<u>After</u>	<u>2.1</u>				
<u>Average</u>	<u>2.1</u>				<u>252 liter</u>

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>F. Lew</u>	<u>8/19/86</u>	<u>June 1986</u>				

ASB 001 6666

MONITORING DATA SHEET

CLIENT: Fred C. Kent Corp DATE 8/1/86ADDRESS: 700 5th Ave JOB NO: 1000-100-2-001-80New York NY 10025 SAMPLE NO. SAMPLE NO. FILTERS: TENAX: DESCRIPTION OF TEST: Fiber to IMPINGERS: CHARCOAL: air samples done by BULK/WIPE: CEROM. 102: PCM method OTHER: SILICA GEL: LOCATION: Well 907 BAROMETRIC PRESSURE mm HgTEMPERATURE 75 °FPAYMENT: RELATIVE HUMIDITY 48 %CALIBRATED BY/DATE PI 8/14/86 CORRECTION FACTOR (STP)

SAMPLE ID	Flow Rate (l/min)	Start Time	Stop Time	Time Elapse	Corrected Sample Volume (l)
2 Well = 907 Calibration before	2.1	1:10	3:40	2.3 hr	
after	2.1				
average	2.1				315 liters
3 Trip Blank					
Millington					

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
A. Leuz	8/14/86	Chun-Li Chen				

MONITORING DATA SHEET

CLIENT: Fred C. Hart Assoc DATE 8/15/86
 ADDRESS: 530 5th Ave. JOB #: C1005-00-P5001-00
New York, N.Y. 10036
 SAMPLE NO. _____ SAMPLE NO. _____
 FILTERS: _____ TENAX: _____
 DESCRIPTION OF TEST: Airborne air IMPINGERS: _____ CHARCOAL: _____
samples done by *TEM* BULK/WIPE: _____ CHROM. 102: _____
 OTHER: _____ SILICA GEL: _____
 LOCATION: Test Pits 1 & 2 BAROMETRIC PRESSURE 51.2 in Hg
TREP Plant for Test Pits TEMPERATURE 78-83 °F
 PAYMENT: _____ RELATIVE HUMIDITY 58 %
 CALIBRATED BY/DATE Alex 8/15/86 CORRECTION FACTOR _____ (STP)

Analyze by TEM

SAMPLE ID		Flow Rate (l/min)	Start Time	Stop Time	Time Elapsed	Corrected Sample Volume (l)
Test Pit 1						
#1	Upwind	2.0	3:20	4:00	40 min	80 liters
#2	Downwind	1.8	3:20	4:00	40 min	72 liters
#3	Test Pit 2 Upwind	2.25	4:25	4:45	20 min	45 liters
#4	Downwind	1.725	4:45	4:45	20 min	345 liters
4	Tr. Blanks For					
	Test Pit Samples					

RELINQUISHED BY:	TIME/DATE	RECEIVED BY:	TIME/DATE	RELINQUISHED BY:	TIME/DATE	RECEIVED BY:
<u>A. Lee</u>	<u>8/19/86</u>	<u>Enclosure</u>				

APPENDIX A

**PART 2: ASBESTOS IN AIR
AMBIENT (NO FIELD ACTIVITIES)
EVENTS 1 and 2**

(0411P/4:)

041488

ASB 001
2148
DATE

EVENT 1

2149
ASB 001 2000

(0411P/5:)

041488



Name: (Aaron Levy) To: George Dunmyre
 Affiliation: R.T. Lee Group
 Phone: (412) 325-1226
 Address: 350 Hochberg Rd., Marcellville, Pa. 17140
 Client/Job No: ~~111~~ 01005-00-0500/-11
 Job Name: Asbestos Location: Hillington, N.J.

CHAIN OF CUSTODY RECORD

Sample No.	Lab ID. No.	Date Taken	Time Finish	Matrix	No. of Containers	Analysis Requested/Remarks
DW-1-1		5/25/88	1815	Asbestos Air Filter From Filter	Cassette 1	Yamati Method Level 2
DW-2-1		5/25/88	1815	Asbestos Air Filter From Air	Cassette 1	- TEM →
OS-1-1	..	5/25/88	1815	" "	Cassette 1	Please 5 Day
UW1-1	"	5/25/88	1815	" "	" 1	Turnaround
OS-1A-1	:	5/25/88	1815	" "	" 1	" " " " "
Field Blank	.	5/25/88	1815	Asbestos Air Filter From Air	" 1	" " " "
Trip Blank		5/25/88	1815	" "	" 1	" " " "

Comments: TEM Analysis by Yamati Method Level 2
5 Day Turnaround

Relinquished by: Aaron Levy Date: 3/28/89 Shipment Method: Federal Express
 Time: 12:00 Airbill No.: 7593796254

Received by: S. Pearson Date: 3-29-89 Relinquished by: _____ Date: _____
 Time: 9:30 a.m. Time: _____

Received by: _____ Date: _____ Relinquished by: _____ Date: _____
 Time: _____ Time: _____

Final Disposition of Samples: _____

Received by: _____ Date: _____ Time: _____

METEOROLOGICAL DATA EVENT - 1 3/25/88

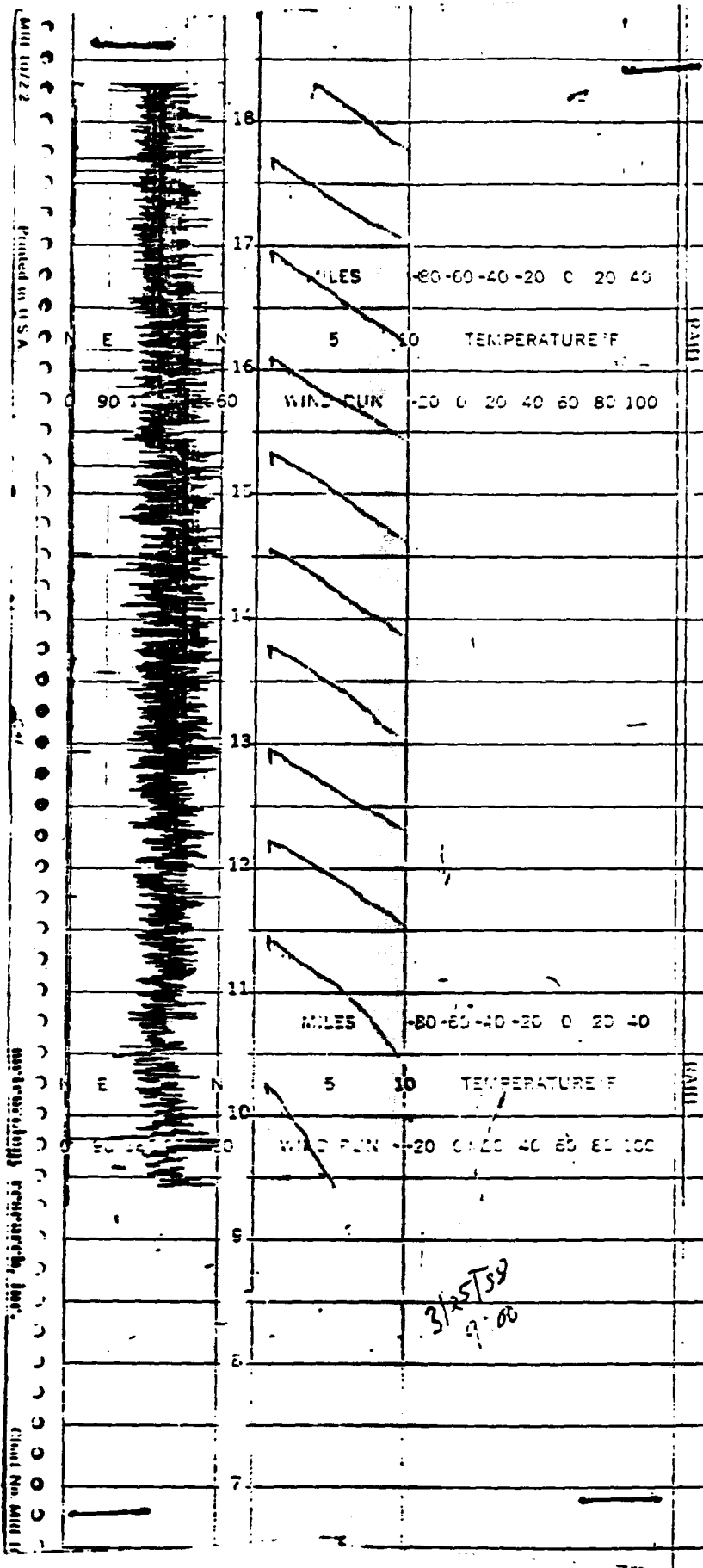


Table I

Total Asbestos Structure Concentration
Project AAH803434

Sample #	Client Sample #	Analyzed Area (sq mm)	Sample Volume (liters)	Structure Counts		Analytical Sensitivity		Concentration	
				Chrysotile	Amphibole	(s/sq mm)	(s/cc)	(s/sq mm)	(s/cc)
HT1803	DW-1-1	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1804	DW-2-1	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1805	OS-1-1	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1806	UW-1-1	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1807	OS-1A-1	0.0666	1440.0	1	0	15.0	0.0040	15.0	0.0040
HT1808	FIELD BLANK	0.0666	Blank	0	0	15.0	-	<15.0*	-
HT1809	TRIP BLANK	0.0666	Blank	0	0	15.0	-	<15.0*	-

* Below Analytical Sensitivity

Authorized Signature George R. Dummery, Jr.
Date Friday, April 8, 1988

RJ Lee Group
Headquarters

350 Hochberg Road
Monroeville, PA 15146

(412) 325-1776
Telefax (412) 733-1799

100 8SV
2017

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1803

QA # HQ0324

Client Sample # DW-1-1

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator DHG

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 2

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	1	1.50	0.30	Nonasbestos				X	
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	1	2.00	0.50	Nonasbestos				X	
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1804

QA # HQ0324

Client Sample # DW-2-1

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator DAA

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 3

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	1	1.20	0.10	Nonasbestos				X	
4	1	2.50	0.10	Nonasbestos	B>10	2		NONE	
5	1	2.00	0.10	Ambiguous	BM_3	3		NONE	
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1805

QA # HQ0324

Client Sample # OS-1-1

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk

# Grid Openings	10
# Asbestos	0
# Nonasbestos	4

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	1	1.20	0.20	Nonasbestos		X		X	
6	0			No fibers					
7	1	1.00	0.10	Nonasbestos	BM3	X		NONE	
8	1	0.60	0.05	Nonasbestos	CM7	X		X	
9	1	0.70	0.05	Nonasbestos	M	X		NONE	
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1807

QA # HQ0324

Client Sample # OS-1A-1

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk

# Grid Openings	10
# Asbestos	1
# Nonasbestos	9

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	1	0.60	0.05	Nonasbestos	CM>5	X		NONE	
1	2	0.80	0.10	Nonasbestos	M	42		NONE	
2	1	0.50	0.05	Nonasbestos	M	X		NONE	
2	2	1.00	0.10	Nonasbestos	M			X	
2	3	0.60	0.05	Nonasbestos	CM>10	X		X	
3	1	0.60	0.05	Chrysotile	M	43		1549	
3	2	1.00	0.10	Nonasbestos	M	X		NONE	
4	0			No fibers					
5	0			No fibers					
6	1	1.20	0.30	Nonasbestos	M			X	
7	1	0.70	0.10	Nonasbestos	M	X		X	
8	1	1.70	0.30	Nonasbestos	CM5	X		NONE	
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1806 QA # HQ0324

Client Sample # UW-1-1

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk

Grid Openings 10

Asbestos 0

Nonasbestos 13

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	1	3.10	0.40	Nonasbestos		X		X	
3	2	0.70	0.10	Nonasbestos	M			X	
3	3	0.60	0.10	Nonasbestos	M	X		NONE	
4	1	1.00	0.10	Nonasbestos	M	40		NONE	
4	2	0.50	0.05	Nonasbestos	M	X		NONE	
4	3	3.80	0.40	Nonasbestos				X	
4	4	0.50	0.05	Nonasbestos	CM7	X		NONE	
4	5	0.50	0.05	Nonasbestos	CM>5	X		NONE	
5	1	10.00	0.50	Nonasbestos				X	
5	2	0.60	0.05	Nonasbestos		X		NONE	
5	3	1.20	0.10	Nonasbestos		X		X	
6	1	0.50	0.05	Nonasbestos	CM>10	41		X	
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	1	0.60	0.05	Nonasbestos	CM11	X		NONE	

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1808 QA # HQ0324

Client Sample # FIELD BLANK

Volume

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk

Grid Openings 10

Asbestos 0

Nonasbestos 0

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803434

Sample # HT1809 QA # HQ0324

Client Sample # TRIP BLANK

Volume

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk 1348

Grid Openings 10

Asbestos 0

Nonasbestos 0

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

EVENT 2

(0411P/6:)

041488

ASB 001 2/60
2/60

(2nd set)

D.C. No.: B 0004



Name: George Dunmyre (From Aaron Levy)
Affiliation: P. T. Lee Group
Phone: (412) 325-1776
Address: 350 Hochberg Rd. Monroeville, Pa. 15146
Client/Job No: 01005-00-85001-11
Job Name: National Symposium Location: Killington, VT

CHAIN OF CUSTODY RECORD

Sample No.	Lab ID. No.	Date Taken	Time Finish	Matrix	No. of Containers	Analysis Requested/Remarks
DW-1-2		3/31/88	8 hrs	Asbestos in Air	1	Yanick Method Level 2 (TEM)
DW-2-2		3/31/88	8 hrs	" "	1	" " " " "
DW-3-2		3/31/88	8 hrs	" "	1	" " " " "
OS-1-2		3/31/88	8 hrs	" "	1	" " " " "
UW-1-2		3/31/88	8 hrs	" "	1	Yanick Method Level 2 (TEM)
Field Blank 2		3/31/88	8 hrs	Asbestos in Air	1	" " " " "
Trip Blank 2		3/31/88	8 hrs	" "	1	" " " " "
					7 total	

Comments: * 48 hr. Turnaround please! Total Volume
* 1440 liters

Relinquished by: Aaron Levy Date: 4/1/88 Shipment Method: Federal Express
Aaron Levy Time: 12:00 Airbill No.: 7593796265

Received by: S. Pearson Date: 4/1/88 Relinquished by: _____ Date: _____
Time: 9:00 am. Time: _____

Received by: _____ Date: _____ Relinquished by: _____ Date: _____
Time: _____ Time: _____

Final Disposition of Samples: _____

Received by: _____ Date: _____ Time: _____

METEOROLOGICAL DATA EVENT - 2 3/31/88

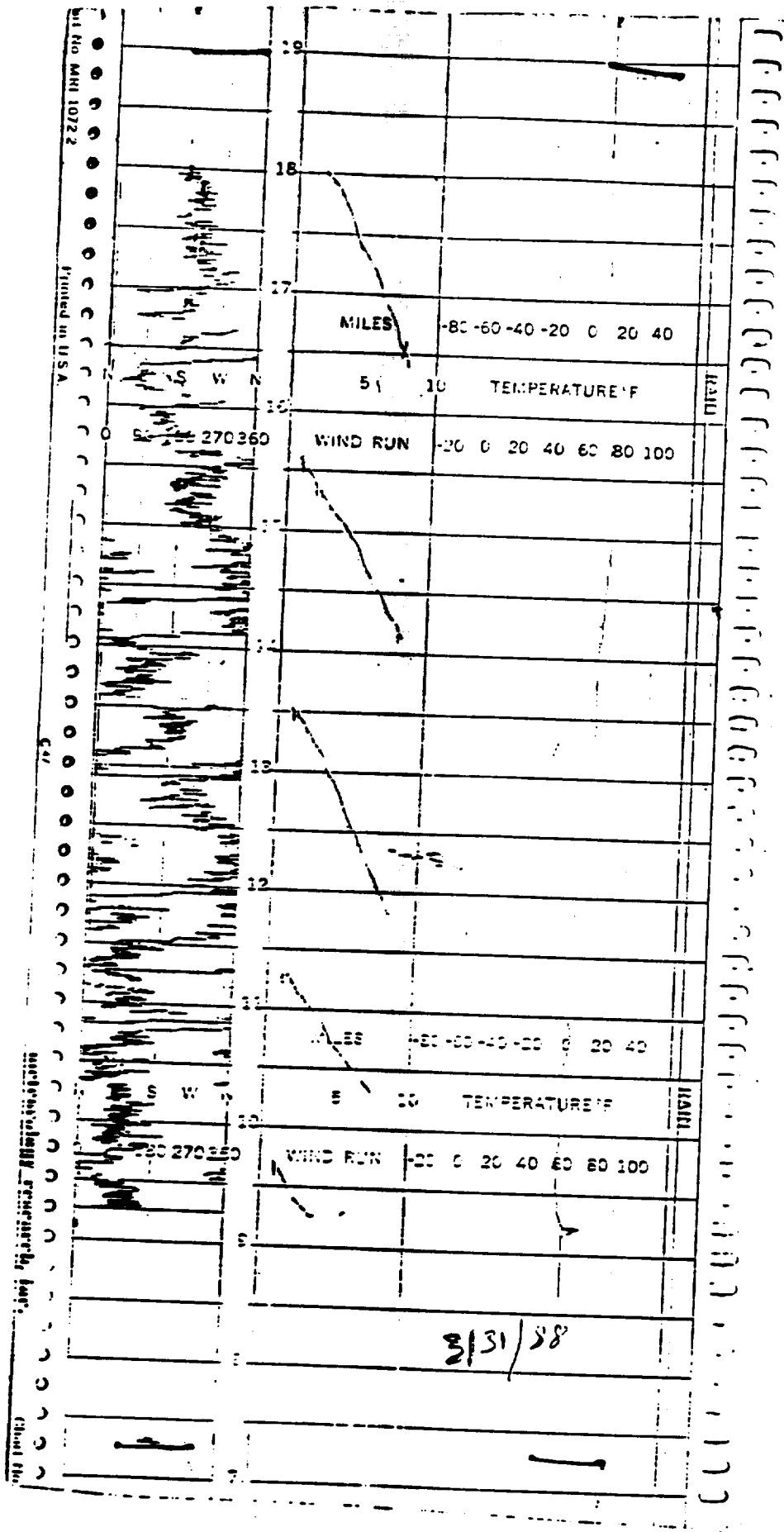


Table I
Total Asbestos Structure Concentration
Project AAI1803454

Sample #	Client Sample #	Analyzed Area (sq mm)	Sample Volume (liters)	Structure Counts		Analytical Sensitivity		Concentration	
				Chrysotile	Amphibole	(s/sq mm)	(s/cc)	(s/sq mm)	(s/cc)
HT1912	DW-1-2	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1913	DW-2-2	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1914	DW-3-2	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1915	OS-1-2	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1916	UW-1-2	0.0666	1440.0	0	0	15.0	0.0040	<15.0*	<0.0040*
HT1917	FIELD BLANK 2	0.0666	Blank	0	0	15.0	-	<15.0*	-
HT1918	TRIP BLANK	0.0666	Blank	0	0	15.0	-	<15.0*	-

* Below Analytical Sensitivity

Authorized Signature George R. Eustrom/ep
Date Thursday, April 7, 1988

RJ Lee Group
Headquarters

350 Hochberg Road
Monroeville, PA 15146

(412) 325-1776
Telefax (412) 733-1799

9912 100 BSV

FIBER COUNT SHEETS

B = Bundle

C = Cluster

M = Matrix

Appendix A

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1912 QA # HQ0341

Client Sample # DW-1-2

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator MRM

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 3

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	1	0.80	0.10	Nonasbestos	C>40	40		X	
8	0			No fibers					
9	1	6.00	0.70	Nonasbestos		X		X	
10	1	2.50	0.60	Nonasbestos				X	

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1913 QA # HQ0341

Client Sample # DW-2-2

Volume 1.440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator MRM

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 9

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	1	0.60	0.10	Nonasbestos	C	X		X	
2	0			No fibers					
3	1	5.00	0.50	Nonasbestos	M	30		X	
3	2	1.10	0.10	Nonasbestos	C>40	X		X	
4	1	6.00	0.90	Nonasbestos	BM>4	X		X	
4	2	1.10	0.25	Nonasbestos	M	X		X	
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	1	1.20	0.10	Nonasbestos				X	
8	2	4.30	0.10	Nonasbestos	C			X	
9	0			No fibers					
10	1	1.40	0.20	Nonasbestos	M	X		X	
10	2	3.00	0.10	Nonasbestos	C>15			X	

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1914 QA # HQ0341

Client Sample # DW-3-2

Volume 1.440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator KD

EDS Disk 1348

Grid Openings 10

Asbestos 0

Nonasbestos 4

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	1	3.40	0.50	Nonasbestos		58	1585	1584	
5	2	0.60	0.10	Nonasbestos	M	59		X	
6	0			No fibers					
7	1	2.70	0.80	Nonasbestos		X		X	
7	2	1.00	0.10	Nonasbestos	M			X	
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name **Fred C. Hart Assoc**

Project # **AAH803454**

Sample # **HT1915**

QA # **HQ0341**

Client Sample # **OS-1-2**

Volume **1,440 Eters**

Filter Lab: **385 sq mm Cellulose Ester Orig.: 385 sq mm**

Microscope **100**

Magnification **20,000X**

Operator **MRM**

EDS Disk **1349**

Grid Openings **10**

Asbestos **0**

Nonasbestos **3**

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	1	2.30	0.20	Nonasbestos	M	X		X	
1	2	0.75	0.25	Nonasbestos	M	X		X	
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	1	4.60	0.60	Nonasbestos	M			X	
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1916

QA # HQ0341

Client Sample # UW-1-2

Volume 1,440 liters

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 1200

Magnification 20,000X

Operator SFS

EDS Disk 1348

# Grid Openings	10
# Asbestos	0
# Nonasbestos	2

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	1	2.70	0.10	Nonasbestos		62		NONE	
3	0			No fibers					
4	1	2.50	0.20	Nonasbestos	M	X		NONE	
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1917 QA # HQ0341

Client Sample # FIELD BLANK 2

Volume:

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator CH

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 0

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

ASB 001 2170

Count Sheet

Client Name Fred C. Hart Assoc

Project # AAH803454

Sample # HT1918 QA # HQ0341

Client Sample # TRIP BLANK

Volume

Filter Lab: 385 sq mm Cellulose Ester Orig.: 385 sq mm

Microscope 100

Magnification 20,000X

Operator CH

EDS Disk 1349

Grid Openings 10

Asbestos 0

Nonasbestos 0

Field	Fiber	Length	Width	Type	Morph	EDS	Photo	SAED	Comment
1	0			No fibers					
2	0			No fibers					
3	0			No fibers					
4	0			No fibers					
5	0			No fibers					
6	0			No fibers					
7	0			No fibers					
8	0			No fibers					
9	0			No fibers					
10	0			No fibers					

ASB 001

2171 L